Memorandum

U.S. Department of Transportation
Office of the Secretary of Transportation

Subject: MEMORANDUM OF LAW: Compliance with Congressional Mandate -- Proposed Project at Georgetown University South Entrance

Date: FEB 18 1999

From: Rosalind A. Knapp
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Reply to Attn. of:

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This memorandum addresses whether proposed improvements to the entrance to Georgetown University from Canal Road, as described in a Final Environmental Impact Statement (FEIS) for that project, meet a statutory condition requiring that they not "decrease the efficiency of a Federal-aid primary highway."[1] It is the opinion of Counsel, based upon a review of the FEIS, accompanying documents, amplification from staff, and relevant legal authorities, that the Preferred Alternative identified for these improvements meets this condition.[2]

Background

1. Congressional Authorization

The Proposed Project is a Demonstration Project authorized by the Surface Transportation and Uniform Relocation Assistance Act of 1987 (STURRA),

[1] This issue was also directly raised in a letter dated September 21, 1995, from Ms. Barbara Kahlow in commenting on the Draft Environmental Impact Statement for the Proposed Project. She has raised the issue several times in other subsequent correspondence.

[2] As a preliminary point, this legal opinion is being issued after the release of the Final Environmental Impact Statement for the Proposed Project, since it was impossible to determine compliance with the statutory condition until the Preferred Alternative had been identified. The Final EIS was published and noted in the Federal Register on January 8, 1999.

Public Law 100-17, April 2, 1987. The specific wording of the authorization at Section 149, Demonstration and Priority Projects, Subsection (14), is:

> "(14) District of Columbia -
>
> (A) PROJECT DESCRIPTION. - The Secretary shall carry out a demonstration project in the vicinity of the C&O Canal in the District of Columbia for the purpose of substantially improving motor vehicle access at a major traffic generator *without decreasing the efficiency of a Federal-aid primary highway.*[3] The Secretary shall enter into such arrangements as may be necessary to carry out such project with the Secretary of the Interior.
>
> (B) LIMITATION. - No Federal assistance shall be provided to carry out the demonstration project under this paragraph until private sources dedicate at least[4] 2.5 acres of land as a scenic easement for project purposes."

The description of the project in the most relevant Congressional Reports largely reiterates the statutory language, and the passage emphasized above is word-for-word the same in those Reports as in the final statute. Conference Rept. No. 100-27 at 185 (March 17, 1987), restating language found earlier at House Rept. No. 99-665 at 31 (July 2, 1986).

Both Reports do, however, indicate that that "Georgetown University would dedicate at least 2.5 acres of land as a scenic easement," indicating that the project was to be in the vicinity of that institution. Id. Earlier legislative efforts had been directed at upgrading the Canal Road entrance to the University, but plans were not implemented because concerns were expressed about traffic backups being caused by left-turning traffic. See FEIS at 1-1. Canal Road is a Federal-aid primary highway.

2. Overview of the Project Area

Georgetown University is located in Northwest Washington, D.C. South of the University is Canal Road - a four-lane Federal-aid primary highway - which runs parallel to the C&O Canal and the Potomac River. There is an access road (identified alternatively as the Georgetown South Entrance or South Access Road, Fowler's Road, or Gym Road) which provides access to the main academic campus of the University from Canal Road.[5] The area to the west and north of the University is primarily residential; the area

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[3] The emphasis is supplied.

[4] The words "at least" were struck from the provision by subsequent legislation, see Public Law 101-164 at sec. 338 (Nov. 21, 1989).

[5] The primary access to the University Hospital, Medical School, and various Medical Center buildings is from Reservoir Road, on the north side of the University grounds.

immediately to the east is the neighborhood of Georgetown, and beyond that is downtown Washington, D.C.

Canal Road is a popular commuter route to the University and downtown from residential areas to the north and west, including Maryland and Virginia suburbs. Foxhall Road and MacArthur Boulevard, other routes from the north and west, feed into Canal Road just west of the University. Traffic from downtown Washington commonly uses the Whitehurst Freeway for access to the University; the Whitehurst intersects Canal Road just east of the South Entrance. Directly across the Potomac River from Georgetown are Rosslyn and Arlington, Virginia. Commuters coming to Georgetown University from Virginia typically use Key Bridge from Rosslyn, or Chain Bridge and then Canal Road from north Arlington. Key Bridge intersects Canal Road close to the intersection with the Whitehurst Freeway. Chain Bridge is west of the University.

The current configuration of the South Entrance Road permits only right turns from Canal Road into the University and only right turns from the University onto westbound Canal Road. The other major entrance to the main academic campus is from Prospect Street, which feeds from the east through the Georgetown neighborhood. Thus, vehicles seeking access to the main campus from the west generally must use Georgetown neighborhood streets (typically Reservoir Road and 35th Street) to get to Prospect, entering the campus eventually from the east. Also, vehicles departing the main campus and seeking to go east or onto the Key Bridge must depart via the Prospect Street entrance and use neighborhood streets (typically Prospect and 34th Streets) to get access to M Street and the Key Bridge.

3. **Description of the Proposed Project**

Pursuant to the authority in the STURRA, a demonstration project was proposed that would provide full turning movements on Canal Road at the University entrance. Such a project would satisfy the first of the statutory criteria, by substantially improving motor vehicle access to Georgetown University (a major traffic generator) at that location. See FEIS at p. 1-4.

Through the planning and environmental impact review process, various alternatives were studied. The Preferred Alternative ultimately identified in the FEIS would create a signalized intersection with a raised median at the South Entrance Road and Canal Road.

Based on concerns that had been voiced earlier about backup of traffic at such a signal, particularly eastbound during the AM rush hour, and conscious of the legal requirement that the "efficiency" of a Federal-aid primary highway not be decreased, further refinements to the basic proposal were made. Thus, while signals would allow eastbound commuters to turn left *into* the

University from Canal Road at all times, they would not permit left turns *from* the University onto Canal Road during the AM peak hours.[6] This allows for the free flow of eastbound traffic on Canal Road in the AM peak. The Prospect Street entrance, which had been considered for closure, would remain open. Timing of traffic signals, and modification of the lanes exiting the University, would also minimize impacts on Canal Road. Perhaps most importantly, the FEIS proposed the addition of an eastbound lane on Canal Road at the Whitehurst Freeway so as to improve traffic flow through that intersection.

Analysis

The legal issue addressed here is whether these mitigation measures are sufficient to meet the STURRA requirement that the project be constructed "without decreasing the efficiency of a Federal-aid primary highway." Before the question can be answered, it must first be determined what these words mean.

4. Defining "Decrease in Efficiency" and "Highway"[7]

The first step in interpreting any statutory provision is to address the plain meaning of its words. Mallard v. United States District Court, 490 U.S. 296, 300 (1989). The word "decrease" means "to grow or cause to grow gradually less or smaller," while the key word "efficiency" is defined as "the quality or property of being efficient." "Efficient" in turn is defined as "acting or producing effectively with a minimum of waste, expense or unnecessary effort." (Definitions are from The American Heritage Dictionary, Second College Ed., 1982). Applying these definitions to the present context, STURRA would require that the project be built without causing a lessening of the ability of a Federal-aid primary highway to handle vehicular traffic effectively, with a minimum of waste or unnecessary effort.

A "highway" is defined as a "main public road, especially one connecting towns and cities."[8] Perhaps most important here is that the statute speaks in general terms to the efficiency of the *overall* highway, rather than of any individual component of the highway. This point can best be made by example. If there were five intersections in the project area affected by the

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[6] Left turns would be allowed from the University onto Canal Road at all other times, however.

[7] The meaning of "a Federal-aid primary highway" is separately addressed in section 6.

[8] The relevant "legal" definition of highway, found at 23 U.S.C. §101, states further that the term "includes roads, streets, and parkways, and also includes rights-of-way, bridges, railroad-highway crossings, tunnels, drainage structures, signs, guardrails, and protective structures, in connection with highways." (This definition goes on to specify a further inclusion for certain interstate or international bridges and tunnels that is not relevant here.) In the context of the issues at hand, these various included terms do not add anything of substance to the discussion, except to reinforce the point that Congress intended that "highway" be used in its general, inclusive sense.

project, and traffic moves more efficiently through four and less efficiently through one, the fact that it flows less efficiently through the one should not be necessarily deemed under the statutory language to render the *entire highway's* efficiency "decreased." Rather, the words indicate that one should look to the overall impact of the project on efficiency of the highway, to determine if there is a net decrease. A corollary of this is that if under some conditions the efficiency is improved and under others decreased, one should again look to the likely overall, or net impact of the project.

Another canon is that statutes must be construed to avoid absurd results and favor public convenience. Bailey v. City of Lawrence, 972 F. 2d 1447, 1452 (7th Cir. 1992). In this regard, it must be recalled that the statute otherwise requires the Secretary to "substantially improve motor vehicle access at a major traffic generator." This militates against measuring "efficiency" in terms of traffic volume or similar quantitative measures, since "improving access" contemplates that additional vehicles will be utilizing that access.

This canon also supports the view that "efficiency" should be measured by overall or net impact of the proposed improvements on the highway, as discussed above. The stated legislative purpose of improving access at the site should not be defeated by a narrow reading of the conditions that are attached to that Congressional mandate. Constructions must be avoided that produce results that are inconsistent with other provisions of the same statute, or render them fairly meaningless. Lake Cumberland Trust, Inc. v. EPA, 954 F.2d. 1218, 1222 (6th Cir. 1992); Marsano v. Laird, 412 F. 2d 65, 70 (2nd Cir. 1969).

A third canon of statutory construction that must be considered here is that technical terms or terms of art used in a statute are presumed to have their technical meanings, unless there is clear legislative intent to the contrary. Ballay v. Legg Mason Wood Walker, Inc., 925 F.2d 682, 689 (3rd Cir. 1991). Highway "efficiency" is not, however, itself a standard technical term in highway design or traffic analysis. In such circumstances, we believe it reasonable to presume that Congress, in charging the Department with responsibility for implementing the requirement, intended that it apply the systems that are customarily used in the trade or profession to measure the ease or difficulty of traffic movement over highways. Highway designers and traffic analysts measure such movements by using systems that measure traffic flow by Levels of Service, and it is such a system that appears most logical to employ here. [9]

The most widely used reference describing Levels of Service, and that used here, is the Highway Capacity Manual (HCM), published by the Transportation Research Board (copyright 1985). The HCM addresses Levels

[9] In a discussion on January 8, 1999 with Ms. Kahlow, she agreed that the Levels of Service analysis was the appropriate mechanism with which to measure highway efficiency.

of Service as "a qualitative measure describing operational conditions within a traffic stream, and their perception by motorists and/or passengers." A level of service definition generally describes these conditions in terms of such factors as speed and travel time, freedom to maneuver, traffic interruptions, comfort and convenience, and safety.

In the HCM, six levels of service are defined for each type of facility for which analysis procedures are available. They are given letter designations, from A to F, with level-of-service A representing the best operating conditions and level-of-service F the worst. In general, the various levels of service are defined as follows for uninterrupted flow facilities:

- Level-of-service A represents free flow. Individual users are virtually unaffected by the presence of others in the traffic stream. Freedom to select desired speeds and to maneuver within the traffic stream is extremely high. The general level of comfort and convenience provided to the motorist, passenger, or pedestrian is excellent.

- Level-of-service B is in the range of stable flow, but the presence of other users in the traffic stream begins to be noticeable. Freedom to select desired speeds is relatively unaffected, but there is a slight decline in the freedom to maneuver within the traffic stream from LOS A. The level of comfort and convenience provided is somewhat less than at LOS A, because the presence of others in the traffic stream begins to affect individual behavior.

- Level-of-service C is in the range of stable flow, but marks the beginning of the range of flow in which the operation of individual users becomes significantly affected by interactions with others in the traffic stream. The selection of speed is now affected by the presence of others, and maneuvering within the traffic stream requires substantial vigilance on the part of the user. The general level of comfort and convenience declines noticeably at this level.

- Level-of-service D represents high-density, but stable, flow. Speed and freedom to maneuver are severely restricted, and the driver or pedestrian experiences a generally poor level of comfort and convenience. Small increases in traffic flow will generally cause operational problems at this level.

- Level-of-service E represents operating conditions at or near the capacity level. All speeds are reduced to a low, but relatively uniform value. Freedom to maneuver within the traffic stream is extremely difficult, and it is generally accomplished by forcing a vehicle or pedestrian to "give way" to accommodate such maneuvers. Comfort

and convenience levels are extremely poor, and driver or pedestrian frustration is generally high. Operations at this level are usually unstable, because small increases in flow or minor perturbations within the traffic stream will cause breakdowns.

- Level-of-service F is used to define forced or breakdown flow. This condition exists wherever the amount of traffic approaching a point exceeds the amount which can traverse the point. Queues form behind such locations. Operations within the queue are characterized by stop-and-go waves, and they are extremely unstable. Vehicles may progress at reasonable speeds for several hundred feet or more, then be required to stop in a cyclic fashion. Level-of-service F is used to describe the operating conditions within the queue, as well as the point of the breakdown. It should be noted, however, that in many cases operating conditions of vehicles or pedestrians discharged from the queue may be quite good. Nevertheless, it is the point at which arrival flow exceeds discharge flow which causes the queue to form, and level-of-service F is an appropriate designation for such points.

These definitions are general and conceptual in nature, and they apply primarily to uninterrupted flow. Levels of service for interrupted flow facilities vary widely in terms of both the user's perception of service quality and the operational variables used to describe them. Each chapter of the manual contains more detailed descriptions of the levels of service as defined for each facility type.

The HCM also discusses highway usage is terms of "measures of effectiveness." For each type of facility, levels of service are defined based on one or more operational parameters that best describe operating quality for the subject facility type. While the concept of level of service attempts to address a wide range of operating conditions, limitations on data collection and availability make it impractical to treat the full range of operational parameters for every type of facility. The parameters selected to define levels of service for each facility type are called "measures of effectiveness," and represent those available measures that best describe the quality of operation on the subject facility type. Thus, the measure of effectiveness for a signalized intersection is the "average vehicle stopped delay," measured in seconds per vehicle, while the measure of effectiveness for an arterial highway is average travel speed (in miles per hour).

Each level of service represents a range of conditions, as defined by a range in the parameter(s) given in the table. Thus, a level of service is not a discrete condition, but rather a range of conditions for which boundaries are established.

5. **Canal Road Suffers No Decrease in its "Efficiency"**

The traffic analysis began with data collection to determine existing traffic patterns for vehicles using the South Campus Parking Lot of the Georgetown University by way of both Prospect Street and Canal Road entrances. Traffic counts were taken and Origin-Destination Surveys were conducted to determine the existing and potential travel patterns of the parking lot users. [10]

The surveys indicated that the Build Alternatives that involved closing Prospect Street would generate up to 228 vehicles using the Canal Road exit. However, the Build Alternatives (including Alternative 2-A Modified, which became the Preferred Alternative) that would keep Prospect Street open were expected to have 166 vehicles use the new left turn exit at Canal Road during the rush hour. See FEIS at page 4-15.

Given this information, the impact of the Alternative 2A-Modified on Canal Road was then analyzed. The analysis was performed in accordance with a system of analysis called NETSIM, short for "Network Simulation Traffic Operations Model." The NETSIM model is a corridor-level program that applies interval-based simulation to describe traffic operations. It preserves the same Level of Service definitions as the HCM; however, FHWA determined that the NETSIM model provided more accurate intersection determinations under that approach than the HCM's Highway Capacity Software (HCS).[11]

Initially, the determination was to consider the impact at the immediate location of the Proposed Project, plus one intersection to either side of the Proposed Project (Canal Road and Foxhall Road to the west, Canal Road and the entrance to the Whitehurst Freeway to the east). However, the NETSIM traffic analysis was extended out another intersection to either side (MacArthur and Foxhall Roads to the west, Canal Road and Key Bridge to the east), to depict broader possible impacts. Based on public comment, the

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[10] All Alternatives in the FEIS were analyzed based on the same total traffic; only the distribution of traffic is different. No additional traffic is expected to be drawn to the site by the Proposed Project. Development at Georgetown University can occur under either Build or No-Build scenarios; however, the University must operate under parking restrictions imposed by the District of Columbia Board of Zoning Adjustment (DC-BZA). In addition, no secondary development would be enabled by the Preferred Alternative. See page 4-2 of the FEIS.

[11] This was because NETSIM has the capacity to simulate a wide variety of traffic controls, including a network with traffic signals operating with different cycle lengths (see page 13, Tab 5 of the Technical Memoranda Supplement to the FEIS). In addition, it considers average stopped traffic delay per vehicle, as well as total elapsed time from when a vehicle slows at the end of a queue until the vehicle departs from the stop line. NETSIM also tracks each vehicle for each second of model simulation. This allows simulation of each driver's behavior, as well as lane choices and total travel time.

intersection at Foxhall and Reservoir Roads was also included in the NETSIM traffic analysis, with the limitations on the reliability of the generated data discussed at Page 5-4 of the Final EIS.

A NETSIM model analysis was first performed to determine traffic impacts of the Alternative 2A-Modified vs. the No Build Alternative, without any mitigation. Once the mitigating effects of an additional auxiliary lane on Canal Road eastbound was identified for the additional vehicles that would be exiting the Canal Road entrance and continuing on to Key Bridge, which would allow two lanes of traffic to move straight through the Whitehurst intersection to Key Bridge rather than the current single lane, that was analyzed as well.[12] The Preferred Alternative includes the addition of this lane.

Six intersections were studied in terms of their service-delay, comparing the LOS for the "No Build" alternative with those of the Preferred Alternative. The results are shown in Table 5-1 of the FEIS, attached as Appendix 1.

In reviewing these results, one first notes an AM degradation in 2016 at Reservoir Road & Foxhall Road from a "D" to an "E+." However, the delay time has only been increased by 0.2 seconds, which is statistically insignificant. The PM "no build" and Preferred Alternative both receive grades of "F," but the delay time there has been increased by almost 10 seconds. In the end, however, neither Reservoir Road nor Foxhall Road is a Federal-aid primary highway, so there is no statutory relevance to these changes.

The degradations for 2016 (from "E+" to "E" in the AM and the statistically insignificant "C/19.7" to "C19.9" in the PM) for MacArthur Road and Foxhall Road are likewise of no statutory significance, given again that Foxhall and MacArthur are not Federal-aid primaries.

At Canal and Foxhall, relevant because Canal is a Federal-aid primary, there are improvements shown for the AM period in both 1998 and 2016. The PM figures are both "C" for 1998 and both "B" for 2016; the one-tenth second increase in delay time projected is not statistically significant.

Flow at the Canal Road – Georgetown University entrance intersection is projected at "A" levels for 1998 and 2016, both AM and PM.

At Canal Road – Whitehurst, overall levels of service remain the same, except for an improvement projected for 2016 in the AM period from a no-build "B" to a build "B+." Within the grades, time improvements are projected (for example, from a no-build delay of 23.2 seconds to a build 20.4

[12] This additional lane was not proposed to accommodate Whitehurst Freeway traffic, which must turn right, but would improve the general flow of all traffic approaching that intersection.

seconds), except for a statistically insignificant degradation from 66.9 to 67.0 seconds for the 2016 PM period.

The data for the Canal Road – Key Bridge intersection show no LOS "letter grade" changes. Delay seconds improve for both AM and PM for 1998; however, they degrade for 2016, from 34.6 no-build to 35.4 in the AM and from 80.2 to 86.4 in the PM. The projected AM increase in delay is de miminis. While whether the larger PM increase should be considered de minimis could be debated, we do not believe that this increase rises to the level of "decreasing the efficiency" of Canal Road. First, the NETSIM analysis points out that the modeled results for Key Bridge (as well as Reservoir Road) should not be presumed to have the same confidence level as the intersections interior to the corridor, because of the greater randomness of entry at these so-called "external nodes." FEIS at p. 5-4. Next, the PM increase is a projection for 2016, obviously subject to other variables that cannot be fully predicted at this time. Further, the 2016 projection would clearly be less reliable than those for 1998, and the 1998 data show delay *improvements* – from 20.1 seconds no-build to 18.9 seconds in the AM[13] and from 15.0 seconds to 11.4 seconds in the PM. The summary LOS "letter grade," representing overall operational conditions and their perception by motorists and/or passengers, remains the same. Most importantly, as discussed above, the statute speaks to the "efficiency" of the *highway*, not to *each and every intersection* of the highway. In the overall context of projected delays at all of the studied Canal Road intersections it is clear from Table 5-1 that the proposed improvements would cause a perceptible benefit to the traveler under the 1998 scenario and is essentially neutral under the 2016 scenario.

This same point is demonstrated as well by the Travel Time analysis, found at Section 5.3 of the FEIS. This section relates, as another comparison measure, the average travel time to traverse the Canal Road corridor. Table 5-2, replicated as Appendix 2, gives a summary of the average corridor travel time for traffic on Canal Road between the Key Bridge and the Canal Road/Foxhall Road intersection.

The Table indicates that there would be improvements, of varying magnitudes, in four of the eight categories of travel time and speed through the corridor. There are three categories that are essentially unchanged, and one category that shows a degradation.

Improvements are projected in the following categories:

- Year 1998 Eastbound AM Peak: Build Alternative would improve travel time from 152.1 seconds to 141.9 seconds, and speed from 19.7 mph to 21.0 mph

[13] This minor improvement should be considered de minimis, however.

- Year 2016 Eastbound AM Peak: Build Alternative would improve travel time from 296.4 seconds to 238.7 seconds, and speed from 10.1 mph to 12.5 mph

- Year 1998 Eastbound PM Peak: Build Alternative would improve travel time from 145.6 seconds to 127.0 seconds, and speed from 17.2 mph to 19.7 mph

- Year 2016 Eastbound PM Peak: Build Alternative would improve travel time from 128.7 seconds to 116.0 seconds, and speed from 19.5 mph to 21.5 mph

The three categories that are essentially unchanged are:

- Year 1998 Westbound AM Peak: Build Alternative would mildly improve travel time from 82.9 seconds to 82.4 seconds, and speed from 37.9 mph to 38.2 mph

- Year 1998 Westbound PM Peak: Build Alternative would mildly degrade travel time from 210.3 seconds to 210.8 seconds, but speed would remain at 17.2 mph

- Year 2016 Westbound PM Peak: Build Alternative would mildly improve travel time from 362.9 seconds to 360.5 seconds, and speed would improve from 10.0 to 10.1 mph

The one category that shows a degradation is:

- Year 2016 Westbound AM Peak: Build Alternative would degrade travel time from 171.9 seconds to 183.4 seconds, and speed would decrease from 19.0 to 17.3 mph

From an overall perspective, the efficiency of Canal Road would be increased under the Build scenario over the No-Build based on this travel time analysis. Not only are more categories positive than negative, but the improvements in travel time in the positive categories clearly outweigh the degradation in travel time noted in the one negative category: improvements of 10.2 seconds, 57.7 seconds, 18.6 seconds and 12.7 seconds vs. a degradation of 11.5 seconds.[14]

Based on this travel time analysis, there is no basis for finding that the Preferred Alternative would cause a decrease in the efficiency of Canal Road.

[14] Also, the one prospective degradation noted would occur in 2016 and is subject to less reliability than the improvements projected for 1998.

6. **Defining "A Federal-Aid Primary Highway"**

An ambiguity is presented in the STURRA's reference to "a Federal-aid primary highway" -- whether the highway intended was Canal Road, or whether any other Federal-aid highways in the impacted area were also intended to be included.

The difficulty here is not with the definition of "Federal-aid primary highway," which referred to a specific category of highways defined at Title 23, United States Code, section 103. The highways in that category are readily identifiable. The ambiguity, rather, is with the word "a."

As before, we begin with the plain language of the statute.[15] According to The American Heritage Dictionary, id., the first meaning given the word indicates that it is "used before nouns and noun phrases that denote a single, but unspecified, person or thing." The fourth meaning given is "any." If the first meaning were intended, the condition would attach to a single, unspecified highway, which to avoid absurdity would have to mean Canal Road. If the fourth meaning were intended, the condition would attach to any Federal-aid primary highways, which again in order to avoid absurdity would have to mean those such highways that would be reasonably affected by the project.

In cases of ambiguity, one may turn to legislative history for guidance. District of Columbia v. Onley, 399 A2d 84, 86-7 (DC App 1979). As noted above,[16] neither the words of the Conference Committee Report nor the House Report for the STURRA indicate what highway or highways were intended to be encompassed by this language.

However, earlier, less authoritative legislative history suggests that Canal Road was the focus of the Congressional intention. This can be inferred from the fact that there was discussion of the Proposed Project in regard to Congressional bills prior to the 1987 STURRA. Appropriations for a project at the south entrance to Georgetown University appeared in House bills earlier in the decade before finally passing both Houses in 1987. In the June 14-16, 1983, Subcommittee hearings in the House (titled "Review of the Implementation of the Surface Transportation Assistance Act of 1982", 98-1), there was discussion of the project. Georgetown University's representative was asked if Canal Road was part of a Federal-aid system. In a letter dated June 17, 1983 (at page 466 of the Hearing documents), the University responded that Canal Road between Chain Bridge to Key Bridge is part of the Federal-aid Primary system. Thus Congress was made specifically aware that

[15] See discussion and citations at p. 4.
[16] At p. 2.

Canal Road was a Federal-aid primary highway. While not definitive, this suggests that the Congressional reference was to only Canal Road.

We have also considered, in the context of the object and purpose of the legislation, whether one interpretation is more "reasonable" than the other. Here, in arguing in favor of the notion that Congress would more likely have intended the "any" meaning, one could assert that Congress logically would not have supported a project that caused additional delays to motorists – whether on Canal Road or elsewhere. Another argument supporting this view is that if Congress wanted the condition to apply only to Canal Road, it could simply have said so. (After all, it is easier to say "Canal Road" than "a Federal-aid primary highway.")

The arguments to the contrary begin with consideration of the nature of a demonstration project. Congress ostensibly authorizes highway demonstration projects to "demonstrate" some novel or different planning or engineering approach. The normal expectation is that construction of an access improvement onto a major arterial, which would introduce additional traffic volume onto *that* highway, would be expected to increase delays on *that* highway. Thus, a planning or engineering approach that would *not* have that effect would certainly qualify as a demonstration project, and give Congress a basis for authorizing it as such. It is also in the nature of most highway demonstration project legislation to describe intended projects in general terms. Clearly, Congress here intended the project to improve the south access to Georgetown University. If it didn't specify "Georgetown University" in the statute it logically would not have specified "Canal Road" either. Finally, if Congress were presumed to desire that motorists in general not be burdened with additional delays, it seems anomalous that it would restrict the condition only to Federal-aid primaries. Foxhall Road, a non-primary, would be more predictably impacted than Whitehurst Freeway, a primary, yet the words Congress chose afforded no special protection to the Foxhall Road commuters.

In balance, from analyzing both the legislative history -- which, however sparse, at least affords *some* insight into intent -- and the reasonableness of the alternative interpretations in the context of the legislation's object and purpose, we believe the better view is that the condition was intended to be limited to Canal Road.[17]

7. Further Analysis of Impact on Whitehurst Freeway

Notwithstanding the above conclusion, however, we note that the FEIS in fact contains a discussion as to the projected impacts on the Whitehurst,

[17] Thus, for example, there is no defect in the fact that the FEIS's chapter on traffic analysis focused its attention on Canal Road.

specifically at its intersection with 27th and K Streets N.W. (This intersection is a focus of opponents' concerns on this issue.[18]) In view of these concerns, and also for purposes of both completeness and argument, this discussion should be noted.

The FEIS, at Appendix F-3, contains a copy of a letter dated June 29, 1998 from the FHWA Division Administrator for D.C. to the D.C. Department of Public Works. A portion of this letter documents that the 27th and K intersection was studied:

> Based on O/D [Origin and Destination] surveys and this analysis, we believe that noticeable traffic impacts associated with this project do not extend beyond the intersections studied. At some intersections within this corridor, the intersection delay increases a very small amount; at others the delay decreases. We also performed an intersection analysis of the Whitehurst Freeway/K Street/27th Street intersection to ensure that negative traffic impacts did not occur on Whitehurst Freeway beyond the Canal Road intersection (see enclosed analysis titled "K Street and Whitehurst Freeway"). The 13 additional vehicles in the PM peak hour that are projected to use the Whitehurst Freeway account for an increase of 0.35% in the intersection volume and results in about 0.2 second increase in intersection delay....

Based on our further inquiries, FHWA staff explained the origin of this computation. As noted above, Traffic Origin and Destination surveys identified 166 vehicles as expected to use the new left turn exit provided by the Proposed Project in the PM peak hour. FEIS at 4-15. Of these, the O/D survey identified 21 as expected to turn right onto Whitehurst Freeway, 142 would turn right onto Key Bridge, and 3 vehicles would continue straight onto M Street. FEIS at Figure 4-8. Under the No Build alternative, 8 vehicles would exit the Prospect Street entrance, turn north to Reservoir and turn left onto Foxhall, then left onto Canal Road, then turn right onto Whitehurst Freeway. Ibid. (This is very circuitous route, but some vehicles do use this route now.) Therefore, the number of *additional* vehicles seeking to get to the Whitehurst Freeway by way of Canal Road would be 13 (21 – 8). The study done for the Final EIS showed a traffic volume of 3,700 at that intersection. Thirteen vehicles out of 3,700 is 0.35%.

However, as it had been alleged[19] that this intersection was operating at LOS F, an additional traffic analysis was done for that intersection using the

[18] This intersection is near the residence of Ms. Kahlow.
[19] By Ms. Kahlow.

Synchro 3 System, a proprietary software program which implements the methods of the 1994 Highway Capacity Manual.[20]

The Synchro 3 System was used to analyze the intersection capacity and to determine if the Level of Service would be affected by the Preferred Alternative. Using that System, it was determined that the intersection did not operate at a LOS F,[21] but at an overall level of LOS B, when traffic signal optimization was incorporated.[22] Even the individual turning movements within the intersection were rated at not lower than LOS D. It was also determined that the Level of Service would not be affected under the Preferred Alternative. This was true even though the signal optimization was used for both the analysis of the No Build and the Preferred Alternative.

The Synchro 3 runs for the intersection of 27th and K are shown in Appendix 4. The figures highlighted in Appendix 4 show the increase of 13 vehicles. At the bottom, the "Percentile LOS" row shows no changes in any level of service resulting from the addition of these vehicles.

Based on this analysis, the Final EIS indicates that there would be no significant impacts to the intersection of 27th and K because of the construction of the Preferred Alternative. Cf. Appendix F-2 of the FEIS, at "BC." Assuming the accuracy of the data, we would agree, as a 0.2 second delay in intersection time constitutes a de minimis change.

A final argument has been made[23] that the traffic data showing an increase of 13 vehicles using the Whitehurst eastbound in the PM peak must be in error,

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[20] A NETSIM analysis was not performed because of the limitations in the NETSIM for intersections beyond two on either side of the proposed project – especially one 3,000 feet away where the entry of traffic from the Key Bridge also affects traffic flow. As noted above, this limitation is discussed in the Final EIS at page 5-4. While the HCM methods, including the Synchro 3 System, also have their limitations (as discussed in the Final EIS at page 5-1), it is considered sufficiently accurate to determine the Level of Service, and was considered to be the best choice for analysis of an intersection at this remove from the Proposed Project. In addition, there was not considered to be sufficient justification for the significant additional cost of performing a NETSIM analysis for that intersection.

[21] The Study prepared for DC DPW on the so-called "Passonneau Plan," which did not incorporate signal optimization, found that this intersection had a Level of Service at LOS D - not LOS F. The Study showed that *had the Plan been adopted*, the LOS *would have declined* to an F, but the Plan was not adopted. (Appendix 3 consists of two pages from the Study. Figure 7 depicts the Level of Service for "Existing Roadway Geometry" and shows a D/D for the 27th and K intersection, while Figure 8 depicts the same for the geometry "Under [the] Passoneau Plan," and shows an F/F.)

[22] Signal optimization was used for the NETSIM analysis discussed above and is included in the mitigation being proposed for the Preferred Alternative. See Final EIS at page P-4.

[23] By Ms. Kahlow.

because if over 10% of vehicles of incoming traffic arrives via the Whitehurst, then the same percentage should be expected to depart that way.

The proponent of this view argued[24] that data in the Final EIS indicated that 228 vehicles would turn left from the Canal Road exit during the PM peak. Contending that the same number of vehicles should be expected to depart as enter via the Whitehurst, she projected that the correct number of vehicles that should be expected to use the Whitehurst at PM peak should be 24, not 13. [25]

In response, it should first be noted that the estimate of 228 vehicles was for those alternatives that would have closed the Prospect Street entrance. The Preferred Alternative, which keeps Prospect Street open, would generate an estimated 166 vehicles using the new left turn exit at Canal Road during the evening peak hour. FEIS at 4-15. Applying the "10%" concept – assuming for sake of argument that it is statistically valid – the same methodology would show 17 vehicles, not 24, using the Whitehurst at the PM peak.

Secondly, especially in urban situations where traffic restrictions frequently are in effect and traffic conditions can often differ hour-by-hour, it is not unusual for drivers to use different routes in commuting. For example, a motorist using the George Washington Parkway southbound is prohibited from using the Key Bridge access ramp between 7 AM and 9 AM. If commuting to Georgetown University, an alternative for such a motorist during the AM rush would be to continue on the Parkway to the Roosevelt Bridge, which is less than 1 mile further south, and then double back via the Whitehurst. In the PM, access from the Key Bridge to the northbound Parkway is not so restricted. The motorist would be unlikely to retrace his or her steps via the Whitehurst, as it would be far more convenient to cross the Key Bridge directly and take the unrestricted right turn onto the Parkway.

Third, given a choice between actual survey data and extrapolation from data subject to numerous variables, the survey data would seem to be the more reliable.

Finally, even if the increase in traffic should be considered to be 24 additional vehicles per peak hour rather than 13, even doubling the amount of additional cars per peak hour to be considered would still result in a less than 1 percent increase in the intersection volume (since 13 additional vehicles results in less than 0.4 percent). According to FHWA staff, the impact of a less

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[24] Letter of Ms. Kahlow to Jim Dann, DOT/GC, dated Jan. 25. 1999.

[25] More completely, Ms. Kahlow's letter states that "The final EIS estimate of only 13 additional cars...is inconsistent with the data in the Final EIS (p. 4-15 says 228 vehicles will use the left turn exit in the PM-peak under 2A-Mod.; 10.4% (10.6% using the Whitehurst to arrive minus 0.2% currently using the Whitehurst to depart) is 24, not 13 cars."

than one percent increase in traffic volume would not be considered sufficient to cause a drop in the Level of Service.

Therefore, even if for argument's purposes the STURRA provision were deemed to include the Whitehurst Freeway as a Federal-aid primary highway, the traffic data obtained indicates that the Preferred Alternative may be constructed without decreasing the efficiency of that Freeway.

Conclusion

Based on the foregoing, it is the opinion of Counsel that the Preferred Alternative, as described and analyzed in the FEIS, does not violate the Congressional mandate against "decreasing the efficiency of a Federal-aid primary highway."

Appendix I

TABLE 5-1

NETSIM Summary of Intersection Levels of Service/Delay (Seconds)

		1998		2016	
INTERSECTION		NO BUILD	2A-MOD.	NO BUILD	2A-MOD.
Reservoir Road & Foxhall Road	AM	E / 45.3	D / 38.0	D / 39.8	E+ / 40.0
	PM	F / 76.3	F / 86.0	F / #	F / #
MacArthur Road & Foxhall Road	AM	C / 20.1	C / 18.8	E+ / 42.8	E / 48.5
	PM	C+ / 15.7	B / 14.8	C / 19.7	C / 19.9
Canal Road & Foxhall Road	AM	C / 21.5	C / 20.9	E / 45.5	E+ / 42.0
	PM	C / 24.4	C / 24.5	B / 13.6	B / 13.7
Canal Road & G.U. Entrance	AM	N/A	A / 0.1	N/A	A / 0.4
	PM	N/A	A / 2.1	N/A	A / 1.7
Canal Road & Whitehurst Fwy.	AM	B+ / 7.2	B+ / 5.5	B / 8.4	B+ / 6.7
	PM	C / 23.2	C / 20.4	F / 66.9	F / 67.0
Canal Road & Key Bridge	AM	C / 20.1	C / 18.9	D / 34.6	D / 35.4
	PM	B / 15.0	B / 11.4	F / 80.2	F / 86.4

Note: Entire table is new to FEIS.
Note: # - Indicates Extreme Delays

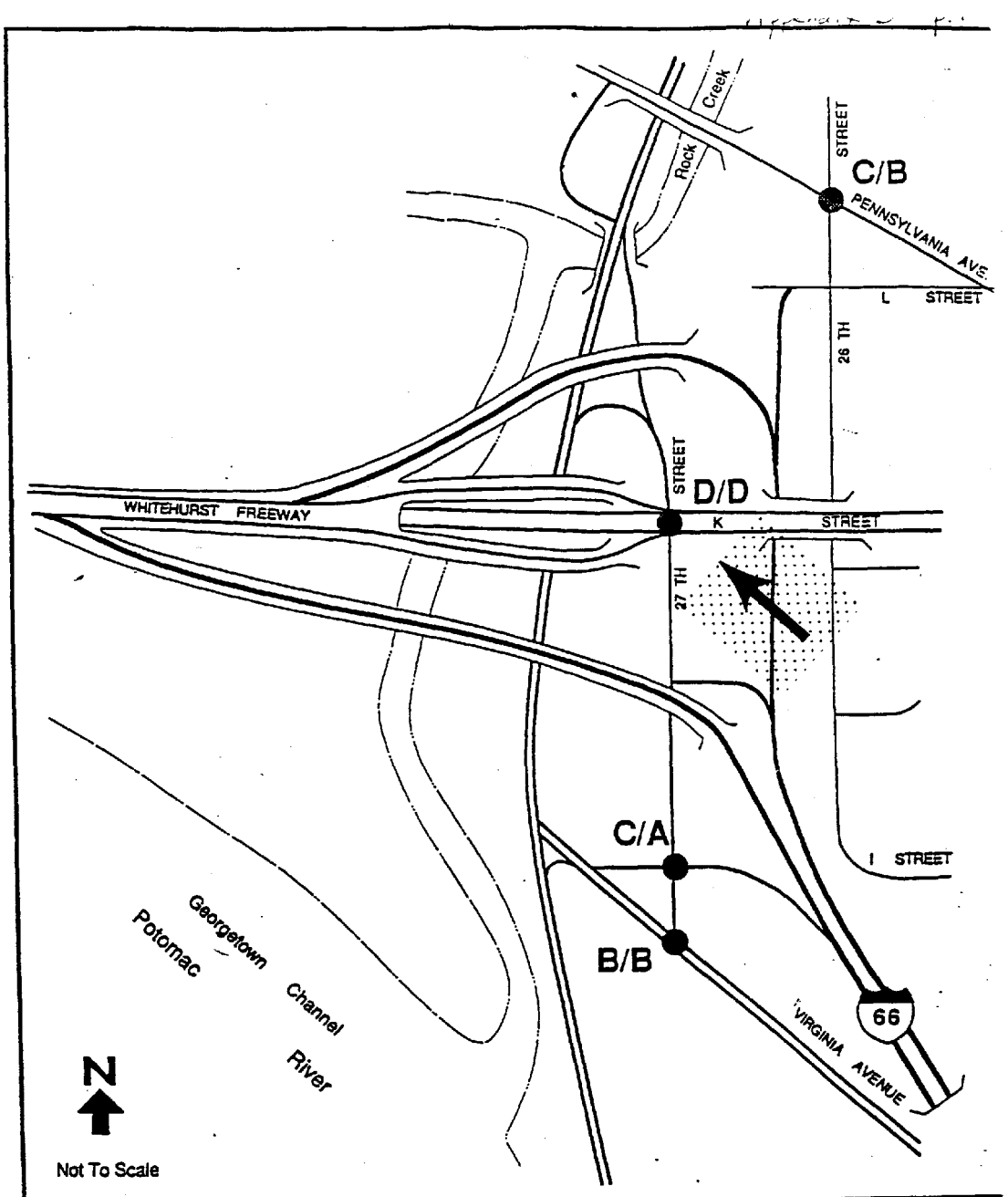
TABLE 5-2

NETSIM Summary of Average Corridor Travel Time and Speed
Federal-aid Primary Route

		1998		2016	
		NO BUILD	2A-MODIFIED	NO BUILD	2A-MODIFIED
EASTBOUND	AM	152.1 sec	141.9 sec	296.4 sec	238.7 sec
	PM	145.6 sec	127.0 sec	128.7 sec	116.6 sec
WESTBOUND	AM	82.9 sec	82.4 sec	171.9 sec	183.4 sec
	PM	210.3 sec	210.8 sec	362.9 sec	360.5 sec
EASTBOUND	AM	19.7 MPH	21.0 MPH	10.1 MPH	12.5 MPH
	PM	17.2 MPH	19.7 MPH	19.5 MPH	21.5 MPH
WESTBOUND	AM	37.9 MPH	38.2 MPH	19.0 MPH	17.3 MPH
	PM	17.2 MPH	17.2 MPH	10.0 MPH	10.1 MPH

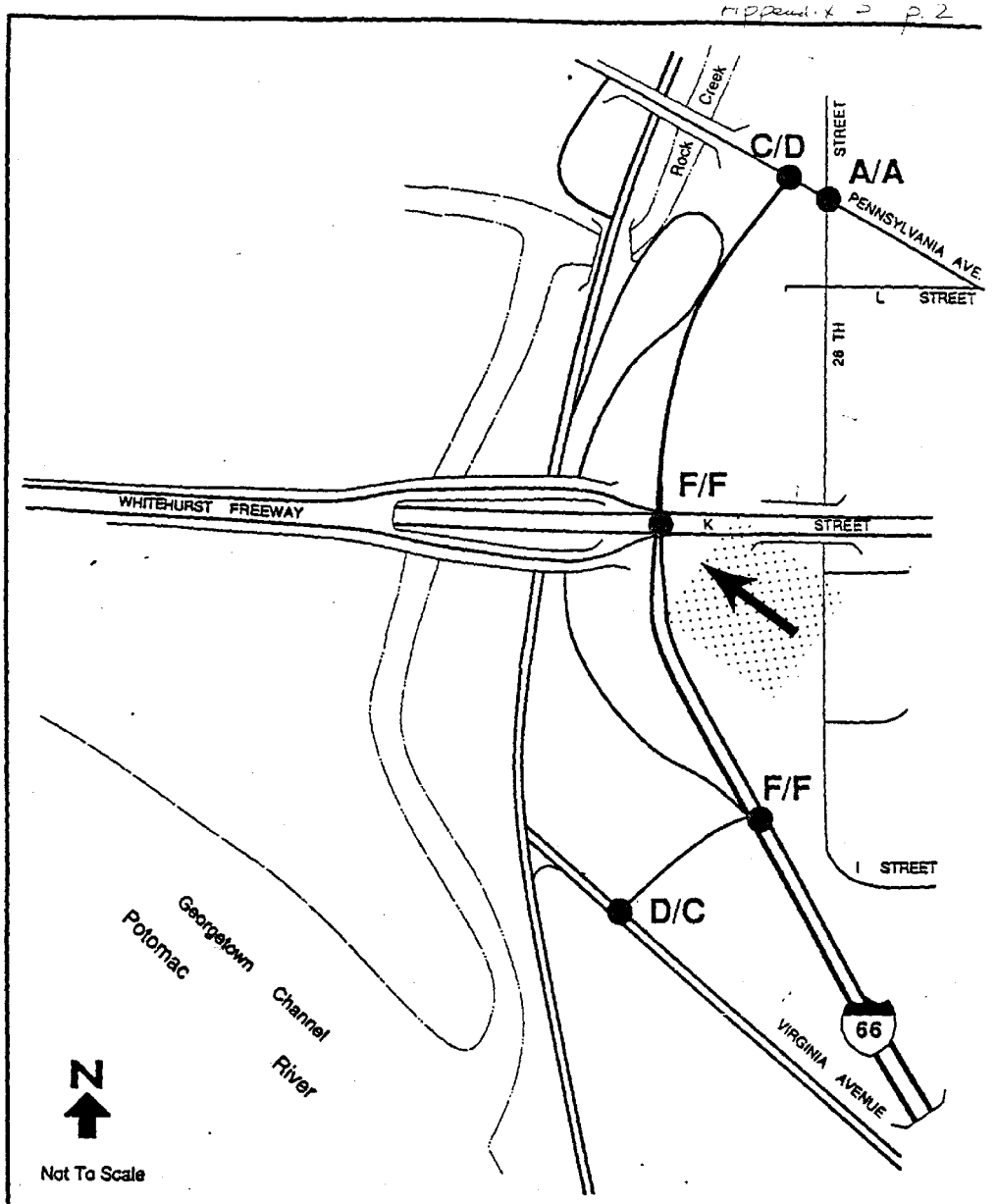
Notes:

- *Entire table is new to FEIS. Time is in seconds. Speed is in miles per hour.*
- *Eastbound AM extends from 700' west of Foxhall Road on Canal Road to just south of the Key Bridge*
- *Eastbound PM extends from the stopbar on Foxhall Road at Canal Road to just south of the Key Bridge*
- *Westbound AM extends from just west of the Key Bridge to the stopbar on Foxhall Road at Canal Road*
- *Westbound PM extends from just west of the Key Bridge to 700' west of Foxhall Road on Canal Road*



WHITEHURST FREEWAY DISTRICT OF COLUMBIA Department of Public Works	LEGEND A/A AM/PM LEVEL OF SERVICE	LEVEL OF SERVICE 1992 TRAFFIC Existing Roadway Geometry FIGURE 7

Appendix 2 p. 2



WHITEHURST FREEWAY DISTRICT OF COLUMBIA Department of Public Works	LEGEND **A/A** AM/PM LEVEL OF SERVICE	**LEVEL OF SERVICE** **1992 TRAFFIC** **Geometry** **Under Passonneau Plan** * Plan not adopted **FIGURE 8**

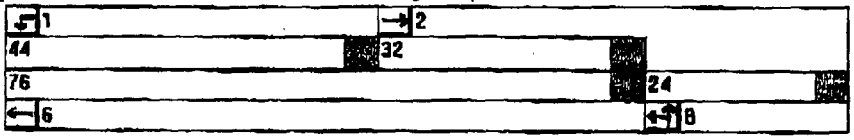
K St & Rockcreek Pkwy Ramp (EXISTING) November 3, 1997

Lanes, Volumes, and Timings Summary

	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Volume (vph)	557	516	610	419	1322	98	0	4	0	0	188
Adj Lane Grp Vol.	1311	0	678	2129	0	109	0	4	0	0	209
Lanes	3	0	1	3	0	1	0	1	0	0	1
Satd Flow (Prot)	5186		1770	4951		1770		1583			1425
Satd Flow (Perm)	5186		233	4951		1770		1583			1425
Left Turn Type	Perm		P/P			Split			Split		
Right Turn Type		Pm+Ov			Perm			Pm+Ov			Free
Phase Number	2		1	6		8	8				
Phase Lagging?	Lag		Lead								
Maximum Green (s)	28		40	72		20	20				
Yellow Time (s)	4		4	4		4	4				
V/C Ratio	1.52dr		0.85	1.40dr		0.29		0.00			0.15
Actuated V/C Ratio	0.87		0.85	0.59		0.29		0.00			0.15
Percentile Delay (s)	25.2		18.2	4.9		25.6		3.8			0.0
Percentile LOS	D		C	A		D		A			A

Cycle Length: 100
Control Type: Pretimed
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Intersection V/C Ratio: 0.72
Intersection Percentile Delay: 13.2
Intersection Percentile LOS: B
dr: Defacto Right Lane. Recode with 1 though lane as a right lane.

Splits and Phases: K St & Rockcreek Pkwy Ramp



K St & Rockcreek Pkwy Ramp (w/GU ENT.)

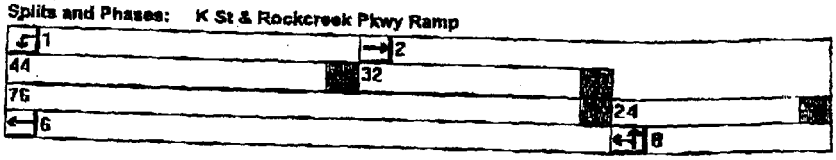
November 3, 1997

Lanes, Volumes, and Timings Summary

	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Volume (vph)	570	516	610	419	1322	98	0	4	0	0	188
Adj Lane Grp Vol	1326	0	676	2129	0	109	0	4	0	0	209
Lanes	3	0	1	3	0	1	0	1	0	0	1
Satd Flow (Prot)	5191		1770	4951		1770		1583			1425
Satd Flow (Perm)	5191		233	4951		1770		1583			1425
Left Turn Type	Perm		P/P			Split			Split		
Right Turn Type		Pm+Ov			Perm			Pm+Ov			Free
Phase Number	2		1	6		8	8				
Phase Lagging?	Lag		Lead								
Maximum Green (s)	28		40	72		20	20				
Yellow Time (s)	4		4	4		4	4				
V/C Ratio	1.52dr		0.85	1.40dr		0.29		0.00			0.15
Actuated V/C Ratio	0.88		0.85	0.59		0.29		0.00			0.15
Percentile Delay (s)	25.2		18.2	4.9		25.6		3.8			0.0
Percentile LOS	D		C	A		D		A			A

Cycle Length: 100
Control Type: Pretimed
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Intersection V/C Ratio: 0.72
Intersection Percentile Delay: 13.3
Intersection Percentile LOS: B
dr: Defacto Right Lane. Recode with 1 though lane as a right lane.

Splits and Phases: K St & Rockcreek Pkwy Ramp



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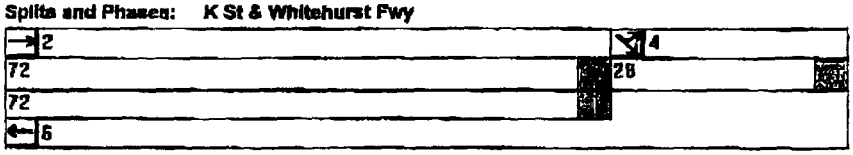
K St & Whitehurst Fwy (EXISTING) November 3, 1997

Lanes, Volumes, and Timings Summary

	EBL	EBT	WBT	WBR	SEL	SER
Volume (vph)	0	214	184	235	486	
Adj Lane Grp Vol.	0	262	488	0	556	0
Lanes	0	3	2	0	2	0
Satd Flow (Prot)		5588	3413		3539	
Satd Flow (Perm)		5588	3413		3539	
Left Turn Type	Perm		Perm		Split	
Right Turn Type			Pm+Ov			Perm
Phase Number		2	6		4	
Phase Lagging?						
Maximum Green (s)		68	68		24	
Yellow Time (s)		4	4		4	
V/C Ratio		0.07	0.21		0.63	
Actuated V/C Ratio		0.07	0.21		0.63	
Percentile Delay (s)		3.8	5.6		25.6	
Percentile LOS		A	B		D	

Cycle Length: 100
Control Type: Pretimed
Offset: 0 (0%), Referenced to phase 2-EBT and 6-WBT, Start of Green
Intersection V/C Ratio: 0.32
Intersection Percentile Delay: 13.8
Intersection Percentile LOS: B

Splits and Phases: K St & Whitehurst Fwy



Appendix F, p.4

K St & Whitehurst Fwy (w/GU ENT.) November 3, 1997

Lanes, Volumes, and Timings Summary

	EBL	EBT	WBT	WBR	SEL	SER
Volume (vph)	0	214	184	235	499	
Adj Lane Grp Vol.	0	262	488	0	571	0
Lanes	0	3	2	0	2	0
Satd Flow (Prot)		5588	3413		3539	
Satd Flow (Perm)		5588	3413		3539	
Left Turn Type	Perm		Perm		Split	
Right Turn Type				Pm+Ov		Perm
Phase Number		2	6		4	
Phase Lagging?						
Maximum Green (s)		68	68		24	
Yellow Time (s)		4	4		4	
V/C Ratio		0.07	0.21		0.65	
Actuated V/C Ratio		0.07	0.21		0.65	
Percentile Delay (s)		3.8	5.6		25.8	
Percentile LOS		A	B		D	

Cycle Length: 100
Control Type: Pretimed
Offset: 0 (0%), Referenced to phase 2-EBT and 6-WBT, Start of Green
Intersection V/C Ratio: 0.32
Intersection Percentile Delay: 14.0
Intersection Percentile LOS: B

Splits and Phases: K St & Whitehurst Fwy